



(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 90301065.0

(51) Int. Cl.⁵: A61K 9/54

(22) Date of filing: 01.02.90

(30) Priority: 03.04.89 US 332154

(43) Date of publication of application:
10.10.90 Bulletin 90/41

(84) Designated Contracting States:
CH DE FR GB IT LI NL SE

(88) Date of deferred publication of the search report:
08.05.91 Bulletin 91/19

(71) Applicant: KINAFORM TECHNOLOGY, INC.
1101-C Lyons Road
Dayton Ohio 45459(US)

(72) Inventor: Eichel, Herman J.
2571 Clarion Court
Columbus, Ohio 43220(US)
Inventor: Massmann, Brent D.
684 Riverview
Columbus, Ohio 43202(US)

(74) Representative: Horner, Martin Grenville et al
Cruikshank & Fairweather 19 Royal
Exchange Square
Glasgow G1 3AE Scotland(GB)

(54) Sustained-release pharmaceutical preparation.

(57) A sustained-release pharmaceutical preparation comprising an admixture of uncoated and/or single walled coated drug, and multi-units of microparticles of a multi-walled coated drug. The microparticle structure preferably has a core drug, an inner wall microencapsular enteric coating, such as a polymethacrylic acid/acrylic acid copolymer or cellulose acetate phthalate, a solid acid such as citric acid, adipic acid, or an acidic ion exchange resin layered onto or included in the enteric layer, and an outer wall microencapsulated control coating, such as a polymethacrylic acid ester copolymer or ethyl cellulose. The multi-walled coated drug has a delayed, gradual, long-term release which takes place in the intestines while the uncoated and/or single walled coated drug has immediate therapeutic properties upon dissolution in the stomach. The enteric coating and control coating may be applied to core drug granules by a coacervation, spray coating or other process. The acid may be a separate layer applied by a spray coating or other process.

EP 0 391 518 A3



DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 212 745 (THE PROCTER AND GAMBLE CO.) * The whole document * - - -	1-4	A 61 K 9/54
Y	DE-A-3 233 764 (W. GABLER)	5-20	
Y	* Page 5, lines 1-4; page 6, line 7 - page 8, line 12; pages 15-17, example 3; claims 1-4,6,10-12 *	5,6,8,9, 10-16	
Y	EP-A-0 212 747 (THE PROCTER AND GAMBLE CO.) * The whole document *	17-20	
Y	EP-A-0 080 341 (A/S ALFRED BENZON) * Page 2, line 27 - page 3, line 4; pages 18,19, example 1; claims 1,21,26 *	7,15	
A	EP-A-0 239 361 (KINAFORM TECHNOLOGY, INC.) * Claim 1 *	1-4	
P,A	EP-A-0 338 383 (SCHWARZ PHARMA AG) - - - - -		

TECHNICAL FIELDS
SEARCHED (Int. Cl.5)

A 61 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	13 February 91	BOULOIS D.J-M.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same category
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention

E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons
&: member of the same patent family, corresponding document